

REMARKS

Claims 5, 6, and 16 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 5-6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Furusawa et al (U.S. Pub. No. 2003/0232128 A1). This rejection is respectfully traversed.

Claim 5 has been amended to recite that the device for forming a wiring ejects the liquid droplets on the substrate such that a predetermined regular interval is disposed between the ejected droplets that is twice a diameter of the previously-ejected liquid drop or less. Support for this amendment is found at least on page 23, line 24 to page 24, line 8. Furusawa is completely silent with respect to such a device.

That is, an object of the present invention is to prevent a defective patterning of a functional material which may cause disconnections or short circuits of the formed film patterns. The present invention relates to controlling the ejecting of liquid drops from nozzles onto the substrates so that the ejected liquid drops are disposed by a predetermined interval, and intervals are further filled by the liquid drops. In contrast, the object of the Furusawa reference is to improve adhesiveness of a film pattern onto a substrate and to realize finer patterns. Furusawa, et al. also relates to controlling a repellency and affinity of the ejected liquid drops onto a substrate. The object, structure, and obtained effect are different between Furusawa et al. and the claimed invention.

Accordingly, Applicant respectfully asserts that Furusawa does not anticipate the claimed invention.

REJECTION UNDER 35 U.S.C. § 103

Claims 5, 6, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kiguchi et al (U.S. Pat. No. 6,599,582) in view of Miyamoto (U.S. Pub. No. 2002/0015800). This rejection is respectfully traversed.

As stated above, the claimed invention has been amended to recite that the device of forming a wiring ejects the liquid droplets on the substrate such that a predetermined regular interval is disposed between each pair of the ejected drops, wherein the interval is twice a diameter of the previously-ejected liquid drop or less. Miyamoto and Kiguchi are silent with respect to this aspect of the claimed invention. Furthermore, neither Miyamoto nor Kiguchi teach or suggest such a device.

In contrast, Miyamoto relates to a method for manufacturing substrates used for a display device using an inkjet method. Miyamoto also discloses adjusting a surface energy of the substrate so that a contact angle defined by a liquid drop and the substrate are a range of 20° to 50°. Further, Miyamoto teaches ejecting the liquid drops containing functional materials. See for example, Claim 1 and paragraph [0045] of Miyamoto.

With respect to Kiguchi, Kiguchi relates to treating fluids chemically or physically which are ejected onto substrates using an inkjet method. An object of Kiguchi is to simplify the treatment, i.e., without using instruments and facilities for a photolithographic method. In a first embodiment, a hot-air blast, laser irradiation, lamp

irradiation, or the like is performed to vaporize solvent components contained in the ejected liquid drops. In a second embodiment, a reaction solution capable of breaking up a dispersion system or initiating a chemical reaction is ejected onto a substrate before liquid drops are ejected. In a third embodiment, a silane coupling agent is applied onto a substrate, or on porous films, e.g., aluminum oxide or silica is applied onto a substrate in order to improve a liquid affinity of the substrate. In a seventh embodiment, a plurality of needle members are used to rub and rectify ejected liquid droplets on a substrate along borders of a pattern-forming region. Further, column 3, lines 28 to 38 of Kiguchi discloses that, "whether or not the pattern-forming region has liquid affinity depends on contact angles." Moreover, column 17, lines 30-67 of Kiguchi discloses that position and direction of ejected liquid droplets are detected by a photo detector 331; and driving signals are sent to drive motors if the detected positions must be corrected. Each of these embodiments, however, does not teach or suggest a liquid droplet device that ejects droplets at a predetermined interval that is twice a diameter of a previously ejected liquid droplet or less. Because this aspect of the claimed invention is not taught by either Kiguchi or Miyamoto, Applicant respectfully asserts that it would not have been obvious to combine their teachings to arrive at the claimed invention.

Claims 5, 6, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kiguchi et al (U.S. Pat. No. 6,599,582) in view of Duineveld et al (U.S. Pub. No. 2002/0060518 A1). This rejection is respectfully traversed.

As stated above, Kiguchi does not teach the newly amended recitation that the device for forming a wiring ejects the liquid droplets on the substrate such that a predetermined regular interval is disposed, which is twice a diameter of the previously-

ejected liquid droplet or less between each pair of ejected liquid droplets. Duineveld also fails to teach this aspect of the claimed device. In contrast, Duineveld relates to controlling the contact angle defined by liquid droplets containing a functional material and a substrate used in a spin coat method or an inkjet method. The object of Duineveld is to overcome a shortcoming of the vapor deposition method in that the vapor deposition is not suitable for mass production of EL devices. Moreover, Figure 1 of Duineveld discloses relief patterns (7, 8, and 9) which prevent color-mixing and unintended emissions of a different color because liquid drops containing electro-luminescent material drain from originally-deposited locations. Duineveld also discloses “contact angles of more than 50°, 60°, 70°, or 80° may also be suitably used to hinder the transport of fluid” (see paragraph [0019]).

Because neither Duineveld nor Kiguchi teach or suggest the claimed device, Applicant respectfully asserts that it would not have been obvious to combine their teachings to arrive at the claimed invention.

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa et al (U.S. Pub. No. 2003/0232128 A1) in view of Kiguchi et al (U.S. Pat. No. 6,599,582). This rejection is respectfully traversed.

Claim 16 is dependent on Claim 5, addressed above. As stated above, neither Furusawa nor Kiguchi teach or suggest the claimed device of Claim 5. Accordingly, Applicant respectfully asserts that Claim 16, which depends from Claim 5 also would not have been obvious.

Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: May 22, 2006

By: 
G. Gregory Schivley
Reg. No. 27,382
Bryant E. Wade
Reg. No. 40,344

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGS/BEW/JAH